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# A Study to Manage Phosphorus in Lake Okeechobee

DECEMBER 2000

## The South Florida Water Management District

is a regional, governmental agency that oversees the water resources in the southern half of the state. It is the oldest and largest of the state's five water management districts.

Our Mission is to manage and protect water resources of the region by balancing and improving water quality, flood control, natural systems, and water supply.

## FOR MORE INFORMATION ABOUT OUR AGENCY

Visit our web site at [www.sfwmd.gov](http://www.sfwmd.gov) or call 561-686-8800 or FL WATS 1-800-432-2045.

## JANUARY 10, 2001 PUBLIC MEETING ANNOUNCED

See Reverse Side for Details

## The Importance of Lake Okeechobee

Lake Okeechobee and its watershed are key components of South Florida's Kissimmee-Okeechobee-Everglades ecosystem extending from the Kissimmee River in the north to Florida Bay in the south. The lake is the second largest freshwater body wholly within the continental United States and provides a number of ecological and societal values to the South Florida region.

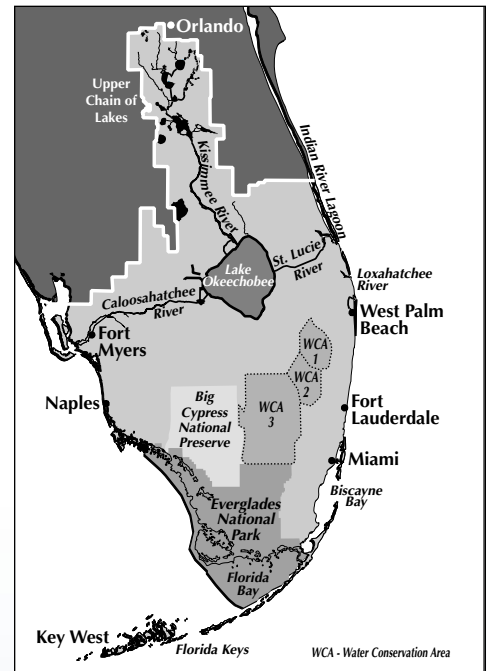
The lake is home to one of the nation's prized bass and speckled perch fisheries and provides a habitat for wading birds, migratory waterfowl, and the federally endangered Everglades Snail Kite. Cities and towns surrounding the lake depend on it as their source for drinking water.

Lake Okeechobee also provides a backup water supply for Florida's lower east coast communities, irrigation water for the expansive Everglades Agricultural Area, and a supplemental water supply for the Everglades. Given these often-competing demands on the lake, management of this water resource is a major challenge of the South Florida Water Management District.

## Excessive Nutrients

During the 20th Century, much of the land around the lake was converted to agricultural use. To the north, dairy and cattle ranching industries developed while in the south, sugar cane and vegetable farming increased. Changes in land use resulted in increased deposits of phosphorus and nitrogen into the lake especially when stormwater runoff occurred.

Phosphorus inputs from the north increased dramatically because of animal agricultural activities. Phosphorus load (nutrient concentration times runoff flow) to the open waters



of the lake nearly tripled between the early 1970s and mid-1980s. Coincidentally, actual phosphorus concentration in the lake itself increased from below 40 to over 100 ppb (parts per billion: if you had a billion ping pong balls and marked one with an "X," that is one part per billion).

Over time, harmful impacts to the lake's overall water quality was evident. Blooms of blue-green algae became more common, with particularly large blooms covering more than 40% of the lake surface in the 1980s. A number of programs are now in place or in development to reduce phosphorus loads to the lake.

Nitrogen inputs from the south were particularly high. They were subsequently reduced after the late 1970s when an "Interim Action Plan" prohibited pumping of agricultural water into the lake except in situations where farmlands would otherwise be flooded.

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## Controlling Phosphorus-Rich Sediment

Recently, scientists determined that controlling the lake's sediment can help reverse the harmful effects of excessive phosphorus. High phosphorus loads have occurred for over 60 years, with more than 30,000 tons accumulating as soft organic mud at the bottom of the lake.

The lake's shallow depth (averaging just nine feet) further contributes to the problem. When strong winds blow across the surface of the lake, mud is stirred up into the water column. This cloudy, sediment-laden water travels to the shore where it hinders the light that submerged plants need to grow. Phosphorus also may stimulate the growth of cattail along the lake's perimeter.

Internal phosphorus sediment loads to the lake (from sediment to water) now equal the external phosphorus loads (from the watershed to the lake). This condition delays lake recovery because even when external loads are dramatically reduced, lake sediment acts as a phosphorus reservoir that continues to release the nutrient into the water. Some combination of sediment removal and external load reduction may be needed to achieve recovery of Lake Okeechobee in a relatively short (decades) time frame.

## The Sediment Management Study

In 1999, a multi-agency team finalized an Action Plan for the rehabilitation of Lake Okeechobee. The Plan outlines steps to protect this water resource and describes a number of projects to reduce nutrient inputs into the lake. The Plan also addresses problems associated with high water levels and the control of internal nutrient loads.

The Plan recommends exploring all options for reducing internal phosphorus loads from the lake's sediment. These may include removal of all or part of the mud sediments, treating the sediments, capping the sediments, or a combination approach. For any one of these alternatives, the magnitude of the effort would be extensive. For example, removing the sediments from the lake would involve extracting approximately 200 million cubic meters of sediment – ten times the amount of material removed from any lake in the world.

To address these issues, the District initiated the Lake Okeechobee Sediment Management Feasibility Study. The study is a three-year project that will analyze all possible options for reducing internal phosphorus loading in the lake. These alternatives will include chemical, physical, and combination approaches. The no-action alternative also will be considered.

The feasibility study consists of five main tasks:

- Task 1. Development of Goals, Performance Measures, and Identification of Impacts
- Task 2. Identification of Alternatives
- Task 3. Work Plan for Evaluation of Alternatives
- Task 4. Evaluation of Alternatives
- Task 5. Stakeholder Prioritization of Alternatives

## Public Meeting Announced

Public and stakeholder input during each phase of the Lake Okeechobee Sediment Management Feasibility Study is essential. The South Florida Water Management District will be conducting public meetings to present information and to solicit input from interested parties. This input will be incorporated into the study and used to assist in the selection and evaluation of alternatives.

The next public meeting is scheduled as follows:

**Purpose:** To provide project information and receive input on the Draft Goals, Performance Measures, and Potential Impacts

**When:** January 10, 2001

**Where:** Okeechobee Service Center  
205 North Parrot Avenue, Suite 201  
(2nd floor of the Bank of America Building)  
Okeechobee, Florida 34972

### – FOR MORE INFORMATION –

Learn more about the Lake Okeechobee Sediment Management Feasibility Study. Visit the Lake Okeechobee web site at [http://www.sfwmd.gov/org/wrp/wrp\\_okee/projects/sedimentmanagement.html](http://www.sfwmd.gov/org/wrp/wrp_okee/projects/sedimentmanagement.html) or contact Karen Smith at [klsmith@sfwmd.gov](mailto:klsmith@sfwmd.gov) or 561-682-2731.

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